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IONIC MEDICATION AND THE CONSTANT CURRENT.

THE important place which galvano-therapy holds in modern therapeutics was indicated by the correspondence which followed the appearance in this JOURNAL of a paper by Dr. David Campbell[1] upon ionic medication. His main conclusion was that the amount of any drug introduced in an ionic state into the body by currents which can be used therapeutically is very small. He found that a drug, as soon as it is carried through the skin, is swept away in the blood stream, and produces its specific effect upon the system generally, and that there is therefore no local concentration. Nor is there any evidence of deep penetration; experimental evidence in animals is all against the belief that a drug penetrates farther than the subcutaneous tissue, and it seems quite clear that a similar state of affairs exists in man.

These conclusions, which Dr. Campbell based upon his own experiments and the results of several other workers, have been challenged by some correspondents; but a study of the literature reveals a really overwhelming mass of evidence in their support.

A belief has prevailed that it is possible by means of an electric current to drive drugs down directly into the muscles and joint cavities. The facts known regarding the rate of migration of ions in an electric current render it almost incredible that this can occur under therapeutic conditions, but in addition very careful tests made upon animals by Inchley,[2] and other results quoted by Turrell,[3] show that the ions do not penetrate directly beyond the subcutaneous tissues. How, then, are we to account for the fact that the many practitioners who resort to ionic medication have become convinced of its efficacy?

In the first place we have a very general consensus of opinion that the constant current is of great value in many conditions, and particularly in the relief of pain in such diseases as sciatica, neuritis, and fibrositis. The exact mode of action is unknown, but various possibilities may be mentioned. Dr. Campbell suggests that the action is simply by way of counter-irritation, and the therapeutic application of the constant current does produce irritation beneath the electrodes. This effect can be accounted for partly by the heat produced; the current is most concentrated beneath the electrodes, and the skin has a far higher resistance than any other tissue traversed; hence there is a maximal production of heat beneath the electrodes. Electrolytic effects in the electrodes also are capable of producing irritation, and such action will be most marked when irritant drugs such as salicylates are present; this may account for the superior results stated to be obtained when the electrodes are soaked in salicylates instead of salt solution.

Dr. Turrell, in a recent letter,[4] has suggested that the benefit is due to the heat produced in the tissues by the passage of the constant current. The objections to this view are that the chief site of heat production must be the skin, and that many observers claim that in many cases the application of the constant current is followed by results superior to those produced by diathermy, although more heat is produced by the latter method. There can, however, be no doubt that heat production plays a very important part in producing the beneficial effects observed. Dr. A. R. Friel has suggested[5] that the important factor is electrical endosmosis, which causes a passage of fluid through the tissues towards the negative electrode. Such an effect can be produced in dead tissues, but it appears doubtful whether it can occur in tissues provided with an efficient circulation. Finally, it is often suggested that the current causes a stream of ions between the two electrodes, and that the cells are stimulated by the passage of these ions through them. The objection to this view is that the surface membranes of cells have a high resistance, so that in all probability nearly the whole of the current passes through the tissue fluids.

Our knowledge as to the action of the constant current is obviously very imperfect, and there is an unpleasant amount of truth in Dr. Turrell's[4] blunt comment: "When we consider that the constant current, the so-called 'ionic medication' or 'ionization,' is commonly ordered by medical men who have no knowledge of electricity or its mode of action, and that the treatment is generally carried out by those who have no knowledge of medicine or the nature of the disease they are treating, it is remarkable that benefit is so often obtained." That such a comment is possible seems to indicate that more regard ought to be paid to teaching electrotherapeutics in medical schools, for there is no doubt that the subject is becoming of increasing importance in practical therapeutics.

Moreover, many of the unsettled problems mentioned above should prove soluble by experiment, and it is to be regretted that more research is not carried out in this interesting and important branch of therapeutics. Dr. Campbell's paper was both interesting and valuable; it is a pity that such papers should have an additional value due to their rarity.

[1] David Campbell: BRITISH MEDICAL JOURNAL, 1923, i, 409.
[2] O. Inchley: *Journ. of Pharm. and Exp. Ther.*, 18, 241, 1921.
[3] W. J. Turrell: *The Principles of Electrotherapy.* Oxford Medical Publications, 1922, p. 11.
[4] W. J. Turrell: BRITISH MEDICAL JOURNAL, March 24th, 1923.

INHERITANCE OF ACQUIRED CHARACTERS.

FOR something like a generation the belief that acquired characters are not transmitted to the offspring, reinforced by Weismann's hypothesis of the "continuity of germ plasm," has held sway. Those who ventured to believe otherwise went in danger of condemnation as heretics. Floods of printers' ink were expended in expounding the true doctrine, but most of the writing was *a priori*. For nearly a quarter of a century Dr. Paul Kammerer, a member of the staff of the institute for experimental biology in Vienna, has been working at the subject by experiments of a most laborious character, which seem to have been very carefully made and very cautiously interpreted. Little, however, was heard about them in this country until last summer, when a member of the Cambridge Natural History Society visited Dr. Kammerer, and studied some of the breeding experiments in progress. The visitor was particularly impressed by certain observations on Alytes, and eventually the Society invited Dr. Kammerer to come to this country; the lecture he gave in Cambridge has now been published.[6]

[5] A. R. Friel: BRITISH MEDICAL JOURNAL, March 17th, 1923.
[6] *Nature*, May 12th, p. 637.

In frogs, which pass the mating period in water, there appears shortly before that time on the inner fingers of the males a dark, rough, horny pad; in Alytes, which mates on land, no such pad appears; but if they are induced to mate in the water—by raising the temperature so that if they went ashore they would be dried up—certain changes gradually appear; among these is a pad limited to the inner fingers in the first season, but extending in subsequent breeding seasons to the other fingers, to the ball of the thumb, and even to the under side of the arm. On examining the skin of the thumb of the normal male it was found to be subject to an annual thickening, and it is characteristic of Dr. Kammerer's caution that in view of this natural tendency to pad formation he does not look upon this observation as affording a trustworthy example of the inheritance of acquired character, even though the pad appeared in four successive generations after the original stimulus of warmth was removed.

Setting these observations aside we turn to others which their author thinks may be regarded as crucial. They were made on an Ascidian, *Ciona intestinalis*. It possesses great powers of surviving mutilation and of reproducing parts that have been amputated. It has two tubes or siphons, water being drawn in by one and expelled again by the other. If the two siphons (inhalent and exhalent tubes) be cut off they grow again, and become somewhat longer than they were previously. By repeated amputations individuals were induced to grow very long tubes in which the successive new parts produced a jointed appearance. The offspring of these individuals had siphons longer than usual, but the jointed appearance has been smoothed out. "That is to say, the particular character of the regeneration is not transferred to the progeny, but a locally increased intensity of growth is transferred." Kammerer was able to go further. Weismann's doctrine of the necessary continuity of germ plasm had previously been shown to be subject to exceptions, and a further experiment made by Kammerer is very significant in this connexion. At the hinder end of Ciona, in the coils of the intestine, lies the generative organ, a hermaphrodite gland. If the whole of this hinder part of the body be removed, the front part regenerates and reproduces a new generative organ, so that the new germ plasm has been formed from somatic tissue. The long-siphoned Ascidian with regenerated germ plasm gave birth to progeny which were long-siphoned. It has been objected to other experiments that the operation, or the change of environment as the case might be, in some way exercised a direct influence on the germ plasm; in this experiment this objection does not seem to apply. The new long-siphoned individuals are the offspring of an animal with a new generative organ formed after the original operation on the siphons, so that that operation can have exercised no influence on the germ plasm.

Another series of experiments, made on Salamandra, yielded some very striking results, though not apparently so conclusive as those with Ciona. It is indeed significant that the most convincing result should have been observed in an organism such as Ciona, which is low in the scale of living things and may therefore safely be assumed to be the more plastic. Man is so highly specialized, and the same is, indeed, true of all the mammalia, as to be very little plastic. None of the instances of inheritance of acquired characters in man, though very many have been reported at one time or another, can be said to fulfil rigid scientific requirements.

THE GROUP CLINIC.

LAST week the Westminster and Holborn Division of the British Medical Association held a meeting at the house in Brook Street, W., where a group clinic has recently been established. The occasion has afforded us an opportunity of giving (p. 876) an account of the interesting experiment in the organization of medical practice which is being made by a group of medical men, including consulting physicians and surgeons and specialists with the co-operation of a general practitioner, who is understood to have originated the idea. It is an attempt to introduce the group clinic system, which has existed in the United States of America for some years, with such modifications as conditions of practice in this country may render necessary. The scheme was outlined by Sir Thomas Horder in an address he gave to the Abernethian Society in January, 1922. Briefly it consists in housing under one roof a group of consultants and specialists, and the experts and equipment for pathological and radiographic investigation required in modern diagnosis. When the circumstances permit the scheme to be carried out to the full the patient is examined by such consultants as seem necessary in his individual case, special investigations are made if necessary, and an inclusive fee charged. It is hoped that in this way there will be a saving of time, money, and worry for the patient without any detrimental effect on the income of the experts forming the group. Sir Thomas Horder has answered in advance several of the objections raised against the proposal, but it is possible that in the process of developing the clinic other difficulties will arise. For example, it is proposed to retain a member of the group, "by preference a general practitioner of considerable experience," to indicate the member or members of the group to whom a new patient may best be allocated; it seems a little doubtful whether this plan will work well and really save time. If it is intended that the clinic shall assist the general practitioner in his work, it may be asked whether the best plan would not be to encourage the general practitioner habitually to do what is already permissible—namely, to select the member of the group who shall take initial charge of the patient. If this were done in every case it becomes a question whether the method of "clerking" for the various experts, which seems to be suggested, will prove necessary. Only experience will show; but it seems possible that the expert will find that the reading of notes combined with the questioning of the patient may take almost as much time as if he had himself questioned the patient in the usual way. There can be little doubt that the patient will as a rule be saved time and worry, and probably also money. This seems almost to imply that each expert in a case will receive less than his usual fee for each patient. On the other hand, the member of the group will be saved some worry, perhaps some time, and probably also some overhead expenditure which when working alone he is bound to incur. It seems possible that difficulty may sometimes arise in connexion with treatment, especially of a surgical nature. It is true that the clinic is supposed to be purely diagnostic in character, and that any member of the group is entitled to seek outside opinion. Nevertheless, if one expert in the group should systematically prefer to seek opinion in some special subject outside the group, will he not run the risk of destroying the mutual confidence of the members? Even if he wishes to maintain solidarity, he may meet with difficulties raised by the patient or the practitioner. We ask these questions with no idea of opposition to the principle of the scheme; they may all be solved satisfactorily, and certainly the courage of the promoters of the clinic is worthy of admiration and deserving of success. The only criticism we have heard from a patient is that the congregation of large numbers in the common waiting-room may lead to embarrassment by the accidental meeting of friends.

AN EPIDEMIOLOGICAL VIEW OF ULTRAVISIBLE VIRUSES.

AT a meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine on May 11th, the President, Dr. R. J. Reece, C.B., M.D., in the chair, Sir William Hamer, M.D., read a paper on the ultravisible viruses considered from an epidemiological point of view. He traced the modern history of the subject from Buchner's demonstration in 1897 of an intracellular enzyme in the yeast cell, and observed that the germs of the bacteriologist might perhaps "assume importance in disease mainly by reason of their being able under certain conditions to live in symbiosis with the generally speaking much more deadly though far more minute ultravisible living particles." The important inter-relationships between the ultravisible germs and the bacteria had been compared "to those between man and the tools he works with; or alternatively to the partnership, on a far vaster though probably less important scale, between alga and fungus connoted by the term lichen." Two questions had to be considered: (1) Were germs "hitherto regarded as causal really primarily concerned with fermentations and with diseases, or merely concomitants—that is, associated organisms"? (2) What was the "status, *qua* organization, of the ultramicroscopic 'enzymes'"? In dealing with the first question, Sir William Hamer referred to Lord Lister's classical researches on the souring of milk, and quoted the remark that "it is far from impossible that there may exist ultramicroscopic organisms, as real, as distinct, in structure, and as potent in their effects as is the *Bacterium lactis*." In these words Lord Lister remarkably anticipated the results of later research, and "saw as in a glass darkly the phenomena now familiarly described as those of 'sporting' or 'mutation' in bacteria, and clearly discerned that ultravisible particles might play a part in these." With regard to the second question, the opinion was expressed that the experimental results suggest that each germ must be assigned a very complex constitution *qua* enzymes; one enzyme might be represented by numerous particles in a condition of great activity and apt for rapid multiplication; another might be poorly represented by particles in an inactive or dormant condition. After outlining the present state of opinion respecting the physico-chemical status of catalysts and enzymes, Sir William Hamer remarked that "it would simplify things a great deal if, taking our courage in both hands, we boldly declared that many 'organic catalysts' are really living organisms." He referred with approval to the late Professor Minchin's speculations regarding the simplest forms of life and their origin, and added that "an outstanding difficulty of the epidemiologist, confronted with all the later developments of the germ theory, is, however, that of explaining persistency of type in epidemic disease—persistency such as that displayed, say, by measles or small-pox . . . In the case of ultravisible germs of epidemic disease, it may be that, while variability of type is favoured by association of the primary ultravisible organism with various satellite secondary invaders, there is an inevitable return, at appropriate intervals, to phases of influence which again and again repeat themselves. Just as syngamy prevents a species from breaking up into strains, so some equilibration between a primary influence and secondary influences encountered in the bodies of the hosts may bring about major waves of epidemic disease." De Vries, he went on to point out, had hinted at something of this kind in his "periodic mutations" of the higher plants, and said that "analogous phenomena will at once suggest themselves to all those who have followed up Creighton's teaching with regard to influenza, scarlet fever, and diphtheria. Minchin's ultramicroscopic chromatin grains may then become endowed by mutation with the capacity for exercising marvellous powers; for while an evening primrose, when it mutates, causes comparatively speaking but little disturbance in the world at large, the ultravisible germ of influenza, on the other hand, when it manifests its greatest effects, the pawn becoming, so to speak, a queen, determines development of influenza in pandemic phase, 'posting' abroad and wreaking terrible havoc among the peoples of the globe."

LIFE AND PROBLEMS IN A MEDICAL UTOPIA.

THE conditions of life in a medical utopia were reviewed by Dr. J. Walter Carr in an entertaining address delivered to the Medical Society of London on May 14th. Those privileged to live under the despotism of some benevolent autocracy, such as a super-ministry of health, will, in the days of a medical utopia, lead a strictly hygienic existence under the watchful supervision of the State from infancy to old age. The young couple about to get married will be provided with certificates of fitness and receive instruction in sex hygiene; pregnancy will be notifiable to the medical officer of health, and the unborn child will be brought into the grip of the municipal authorities even before parturition, which, of course, will not be tolerated in the unhygienic surroundings of the home. Compulsory attendance of mother and child at the infant welfare centre will enable the State to regulate the life of the newborn child until he attains school age, when he will be transferred to the care of the school medical officer, who will in due course hand him on to the panel practitioner when the child ceases school attendance. Soon after birth the question will have to be faced as to which superfluous organs it will be necessary to remove for reasons of personal hygiene and the prevention of future disease. Boys will, of course, all be circumcised, but in all probability the appendix also will be removed as a matter of routine in all new arrivals in the medical utopia. The complete removal of the colon as soon as possible after birth would prevent the onset of intestinal stasis and the innumerable grave, distressing, and common diseases attributable to absorption of toxins from this organ. The colon is a veritable cesspool; its removal is essential to health, and in a medical utopia a race of surgeons would be evolved capable of performing the operation of colectomy with great dexterity and without danger to the patient. For the benefit of conscientious objectors (if such there be) paraffin would be distributed gratuitously by the medical officer of health. Tonsils and adenoids would be compulsorily excised in a well regulated State, and there is much to be said for the removal of teeth of the second dentition immediately or soon after their appearance, instead of removing them one by one after pyorrhoea and decay have inevitably supervened. In women the uterus and mammary glands will be excised after the climacteric in order to avoid malignant disease, and in man at the corresponding period of life the prostate will be removed, any deficiencies in internal secretion being made good by organotherapy. Vaccination against small-pox will be carried out every ten years and a well devised blend of half a dozen organisms will be used for compulsory inoculation against diseases of the respiratory tract, such inoculation being carried out every few months throughout life. Meanwhile, the mind will not be neglected, for the psycho-analysts and interpreters of dreams, who will be attached to all infant welfare centres, schools, and courts of justice will watch over the developing intelligence and by timely intervention nip in the bud those undesirable complexes which, if allowed to develop, would lead to such preventable mental afflictions as neurasthenia, psychasthenia, and melancholy dispositions. Guarded and controlled in this salutary fashion, man will ultimately pass into a condition of simple senile decay, but there will probably be special provision for old people, homes where they can pass their declining days in attractive surroundings equipped with a lethal chamber, under strict medical control,

by means of which the aged may pass out peacefully from the kindly supervision of the authorities of the medical utopia. Will the inhabitants of the medical utopia be better off than the citizens of to-day? Dr. Carr was forced to the conclusion that he would rather see England free than England thoroughly healthy. Despots always abuse their power, and however high-minded may be the conceptions a man desires for his follows they may none the less be completely erroneous. Health depends on obedience to laws, but these laws must be intelligently understood and should be voluntarily obeyed. Social conditions must be improved in the future, but the individual must also be educated to a social consciousness, and a happy blending of socialism and individualism offers a prospect of true evolution. Obedience to the moral law is the only way to a medical utopia.

THE LISTER INSTITUTE.

THE annual report for last year, presented by the governing body to the meeting of members of the Lister Institute on May 16th, is a record of a very large amount of valuable research work done under the inspiration of the director, Professor C. J. Martin, C.M.G., F.R.S., and also of much important routine work conducted in the department for the preparation and study of antitoxic serums at Elstree, and the department for the preparation and study of antivariolous vaccine at Hayle. In the department last mentioned a series of experiments, continuing those conducted in the previous year, has demonstrated that while minor differences in the immunization value of a stock lymph against different strains of African variola exist, a high degree of immunity is conveyed against all those experimentally tested. The experiments lend no support to the view put forward by some medical officers of the Colonial Service that the variola of native West Africans is not the same as the variola of Europe. In the department of bacteriology Dr. M. Cowan has continued her work on strains of streptococci. Mice immunized with the non-virulent (R) type are found to acquire a certain degree of immunity against the virulent (S) type. The results have an obvious bearing on serum therapy in streptococcal infections, and horses are being immunized at Elstree with both types, in order to ascertain whether the resultant serums differ in their protective action. When frequently subcultured both strains remain stable, but in freshly isolated growths left for long periods without subculture the non-virulent type tends to become dominant. Miss D. Steabben, a Jenner memorial research scholar of the Institute, had begun a research into the effect of various organic and inorganic colloids, in the hope of elucidating the physiological basis of so-called "shock" therapy and non-specific vaccine therapy, when her services were requisitioned for the National Collection of Type Cultures owing to the absence of the staff through illness, due to the newly discovered Californian disease, tularaemia. A culture of *B. tularense*, the causative organism, had been received from the Government Health Laboratories, Washington, in the spring of 1922, and passage through guinea-pigs and mice was readily effected. In July Miss Rhodes, the assistant curator, fell ill, and in September Dr. R. St. John Brooks, the curator, and also Dr. Schütze. It became necessary to elaborate a method of serological diagnosis; a suitable antigen was not then available, but from the organs of infected mice, which teem with *B. tularense*, suspensions of the organism were prepared by a special process, and by their aid a diagnosis was established. Dr. Schütze made a rapid recovery, but the infection in the other two members of the staff ran a tedious, chronic course. Both returned to light work in January, but Miss Rhodes contracted what appeared to be a genuine recrudescence of infection shortly after resuming work, and had to be invalided again. A great part of the time of the staff of the department of experimental pathology and assistants working in it was taken up by investigations into questions relating to nutrition and vitamins, with special relation to rickets. Many important and some unexpected results were obtained. To this part of the report we hope to recur at an early date. The governing body, in concluding its report, expresses its satisfaction at the high quality of the work carried out at the institute during the year and the importance of the results obtained, and places on record its appreciation of the devoted and enthusiastic labours of the director and of the scientific staff in the furtherance of the objects for which the Lister Institute was founded.

STERILIZATION OF MENTAL DEFECTIVES.

"Thou did'st prevent me; I had peopled else
This isle with Calibans."

DURING a large part of the second half of last year our correspondence columns bore witness to the interest taken by readers in the vexed question of what is to be done with the mentally unfit. The correspondence on sterilization was initiated by Lieut.-Colonel A. E. J. Lister on July 1st, and was continued by many other readers (among them Sir Archdall Reid and Sir Bryan Donkin) from many points of view—biological, sociological, and administrative. When the debate seemed to be at its height Sir Bryan Donkin laid down the proposition that without a clear understanding of certain key words—inheritance, reproduction, innate, acquired, germinal, somatic, and the like—no useful purpose could be served by discussing the question of sterilization of the feeble-minded. This plea for precision in the use of biological terms seemed to have some effect; at any rate, the correspondence thereupon died down. Interest in the subject has, however, been maintained, as is evidenced by the discussion at the annual meeting of the Westminster and Holborn Division (BRITISH MEDICAL JOURNAL, May 5th, pp. 754, 760). The subject was introduced by Dr. Gibbons, whose paper, which was published in full, has provoked some further correspondence, which, however, does not seem likely to add much to our information, beyond the fact that some of the laws passed by State legislatures in America are not enforced. By a coincidence we have received quite recently from New Zealand a communication on this matter by Dr. Clennell Fenwick, C.M.G., consulting surgeon to the Christchurch Hospital. He sends us extracts from the local newspaper showing the interest taken by certain hospital authorities in the problems of mental degeneracy. In New Zealand the hospitals are managed by hospital boards, elected by the ratepayers. Not the least active of these is the North Canterbury Hospital Board, which has lately shown its concern for the public welfare by referring to its hospital committee, whose chairman is Dr. Fenwick, the question of the sterilization of mental degenerates and epileptics. The committee passed a series of recommendations, and these were adopted by the board. Apart from the merits or defects of the recommendations, their formal adoption has this advantage, that it implies subsequent consideration of the whole question by the Government of New Zealand. In further proof of the attention now being devoted to this problem by the medical profession at home and abroad, we may note that the Section of Medical Sociology at the forthcoming Annual Meeting of the British Medical Association at Portsmouth has chosen the topic of mental deficiency in its various aspects as the principal dish in its bill of fare.

MEDICAL WOMEN'S FEDERATION.

THE annual meeting of the Medical Women's Federation this year was celebrated by a dinner held at the Trocadero Restaurant, London, on May 10th. Lady Barrett, C.B.E., M.D., presided, and over 200 members and friends were

present. The official guests included the Earl of Onslow, Captain Elliot, M.P., Sir George Berry, M.P., Sir William Hale-White, Sir Sydney Russell-Wells, M.P., Mrs. Swynnerton, A.R.A., Mr. H. J. Waring, Mrs. Wintringham, M.P., Dr. Alfred Cox, O.B.E., Medical Secretary of the British Medical Association, and Dr. James Neal, General Secretary of the Medical Defence Union. After the loyal toast had been honoured, Lady Barrett gave a brief account of the origin and progress of the Medical Women's Federation. She said that it was only six years since the scattered associations of medical women in Britain were united into one federated body, largely as the result of the efforts and enthusiasm of Dr. Jane Walker. The membership then was 355; now it was 800. The fellowship and helpfulness engendered proved a powerful stimulus. It seemed to be a case of rejuvenescence by conjugation. In the last year, although the subscription had been increased, the membership had increased by over 100. In the first quarter of this year 93 new members had been enrolled. Great interest was being shown by the newly qualified medical women, and in many places hospital students were becoming student associates. This movement, like so many other good things, had originated in the provinces, and on the initiative of the students themselves. Already over 400 students had become associates. The medical women of Britain were also seeking to join hands with the medical women of other countries. The constitution of the International Medical Women's Federation, which was drawn up last year at Geneva, had been approved by the medical women of eighteen countries. They hoped that this international association would do much in the promotion of international friendship and peace. At this, the first dinner of the Federation, they were naturally anxious to entertain as guests their men colleagues in the profession. Medical women were in no way antagonistic to medical men, but desired real co-operation. Sex antagonism within the profession was a bogy. Great contributions had been made to progress by medical men in the past, and they hoped that even greater contributions might be made in the future by men and women working together. The toast list included "The Medical Profession," proposed by the Earl of Onslow; "The Medical Women's Federation," proposed by Sir Sydney Russell-Wells, M.P.; and "The Guests," proposed by Dr. Jane Walker in a humorous and vigorous speech, in which she paid a graceful tribute to the friendly help medical women had always received from their men colleagues. The occasion was a great success in every way.

ATMOSPHERIC POLLUTION AND FOG PREVENTION.

THE question of the extent to which fog in London is caused by atmospheric pollution due to preventable causes was the subject of a report by the Public Control Committee to the London County Council on May 15th. The report describes fog in London as being caused chiefly by the smoke arising from domestic chimneys, industrial operations, railway and road locomotives, and steam vessels on the Thames and its subsidiary waters. On account of the extent of the drained area and the artificial warmth of the city there is reason to believe that if the smoke conditions of London and of the populous surrounding area, especially to the east, were mitigated, conditions favourable to the formation of fog would not arise so readily in London as elsewhere. During the last twenty years there has been a great development in the use of gas and electricity for heating purposes. The three gas companies which supply London had only about 600,000 appliances in use for cooking and heating twenty years ago; now they have more than two millions. The number of millions of units of electricity sold annually for all purposes in London twenty years ago was 66, now it is 450, and this increase is almost entirely due to the extended use of electricity for heating and power, because, although the use of electricity for lighting purposes has increased, the efficiency of the electric lamp has increased also, and the amount of current consumed in lighting is thought not to be appreciably greater. The Committee repeats the conclusion reached by many predecessors when it expresses the opinion that the domestic chimney is responsible for a large proportion of the London fog. Nearly five million tons of coal are consumed annually in London for domestic purposes. The remedy suggested is that steps should be taken to induce builders to fix types of grates which will be effective for warming and yet in large measure smokeless when burning bituminous coal, and so constructed that gas appliances can readily be fitted to them. The Committee agrees also with the opinion so often expressed in the past that the use of the old-fashioned kitchener should cease. In industrial and railway operations, plant and boilers can be so constructed and worked as to produce very little visible smoke. When an engineer is careful about the calorific value of the coal supplied to him, the conditions of his furnaces, and the methods of his stokers, he not only does not offend in the matter of smoke emission, but he works with an economy of coal consumption not otherwise obtainable. Certain observations have been made at lofty points in various parts of London, and during five periods of two hours each the total number of black smoke nuisances observed was 1,288, and of smoke not black 1,178. Serious smoke nuisance occurs at the Royal Arsenal and Dockyard, Woolwich, which is exempt from the provisions of the Public Health Acts, With the exception of nuisances from rail and road locomotives, the dilatory machinery of the Public Health Acts has to be employed in dealing with offences. The Committee considers that if the smoke nuisance is to be effectually prevented progressive penalties must be provided for offences. It suggests certain lines along which local authorities might co-operate with manufacturers and others, and generally endorses the broad and comprehensive proposals of the Departmental Committee on Smoke and Noxious Vapours Abatement. The report agrees that the problem has now become so acute that a well-thought-out and properly co-ordinated solution is manifestly called for, and that the existing law on the subject is chaotic and largely ineffective and requires codification. Local authorities are ill equipped with the necessary powers for enforcing compliance with the statutes, and there exists at present no encouragement to manufacturers and others to diminish the large volumes of smoke poured into the atmosphere. The Government is asked to introduce at an early date legislation on the lines indicated in the report of the Departmental Committee.

THE SURREY AND CROYDON VOLUNTARY HOSPITALS COMMITTEE.

IN an admirably brief document the Surrey and Croydon Voluntary Hospitals Committee has issued its report for the year 1922. After tracing the origin of the Committee to the recommendations of the Cave Report, and describing its constitution with Lord Cave himself as chairman, the report comments on the memorandum on the hospital accommodation available in voluntary hospitals of the Surrey area, drawn up by Dr. Cates at the request of the Committee. Dr. Cates, who is County Medical Officer of Health, arrived at certain conclusions which were adopted by the committee; one was that from the public health point of view the number of beds in voluntary hospitals in Surrey is insufficient, especially in the accommodation for women and children and for some special diseases; another was that piecemeal extension of small buildings not originally planned as hospitals is uneconomical and to be deprecated; and a third that medical work should be gradually concentrated in larger and better equipped institutions. General hospitals of this type are, it was considered, required in the Guildford, Redhill or Reigate, and perhaps Surbiton or Epsom areas. One of

the first steps taken by the committee was to ask all voluntary hospitals in the area to furnish their last annual report and statement of accounts, together with particulars as to the areas they serve; the request was accompanied by full information of the object and functions of the County Committee. It appeared that only nine out of thirty-two hospitals had applied for grants, and in the end it was only found necessary or possible to approve grants for four hospitals. The Surrey and Croydon Committee made suggestions to the trustees of the late Mr. Leopold Salomons with regard to the distribution of £5,000 among the hospitals of Surrey; it gave advice, at the request of the Earl of Onslow, with regard to a scheme for the extension of the Royal Surrey County Hospital at Guildford; it endeavoured to assist in a scheme for the rebuilding of the Reigate and Redhill Hospital, which came to naught owing to financial considerations; and it is pressing upon the hospitals in its area the importance of adopting a uniform system of accounts. After considering the matter of conflicting appeals for the maintenance of voluntary hospitals, the committee expressed the opinion that a Central Fund for provincial hospitals, formed on the lines of King Edward's Hospital Fund for London, would assist in the development of country hospitals on approved lines. In conclusion, the report states that the work of the committee as local advisers of the Hospitals Commission is likely to be continued throughout the current year, in respect of applications for grants towards the reduction of accumulated deficits; that it is proposed to make inquiries as to the best method of organizing systematic contributions from employers and employees; and that the question of co-operation in hospital administration and the purchase of stores is under examination. The expenses of the committee, which were very moderate, were met out of grants from the Surrey County Council and the Croydon Borough Council. The report seems to show that the Surrey and Croydon Voluntary Hospitals Committee is dealing very tactfully with a difficult problem. If other committees throughout the country are proceeding on the same lines there can be little doubt about the benefits which will accrue to the voluntary hospital system. It seems desirable that time should be given for the development of these committees on advisory lines before any attempt is made to confer upon them definite powers with regard to the co-ordination of hospitals throughout their areas. It would appear that the Surrey and Croydon Committee aims at the ideals of King Edward's Hospital Fund for London, and proposes to devote its energies to development on the lines of that excellent body.

SMALL-POX PREVALENCE.

IN the four weeks ending April 28th, 134 cases of small-pox were notified outside of London. In the successive weeks the numbers were 32, 51, 20, and 31. The counties affected were Derby with 39 cases, Gloucester 25, Lancaster 22, Nottingham 19, the West Riding of Yorkshire 17, the North Riding 5, Durham 4, and Monmouth, East Surrey, and Wiltshire 1 each. In Derbyshire, Clowne and Heanor had 17 cases each; in Gloucestershire, Cheltenham had 18 cases; in Lancashire, Nelson had 21 cases; in Nottinghamshire, Basford had 11 cases, and Stapleford 7. In the West Riding Doncaster had 10 cases, and Sheffield 2, and in the North Riding Middlesbrough had 5 cases. From the beginning of the year to April 28th the notifications numbered 652. The average for the first thirteen weeks was 40; for the four weeks of April it was 34. In reporting on the position in our issue of April 14th (p. 643) it was noted that at Clowne a prominent anti-vaccinationist had been summoned to the police court for failing to notify a case in his house, but was unable to obey the summons because in the interval he himself had been attacked by the disease and removed to hospital. The story is continued in the *Sheffield Independent* of May 1st. The clerk to the District Council of Clowne applied to the magistrates for permission to withdraw the summons, explaining that though the man was formerly opposed to vaccination he had now changed his views on the matter. The magistrates refused the application and decided that the case must go on, but allowed a month's adjournment, presumably because the converted anti-vaccinationist was still in hospital. The chairman of the magistrates made some pointed comments on the District Council's attitude in the outbreak. He said that he understood one woman who was told she had small-pox was told also to stop in the house for a few minutes until the ambulance came, but when it arrived it had to wait for three-quarters of an hour because the woman had gone out shopping! It may be mentioned that the Registrar-General's weekly returns show no fewer than 84 notifications of small-pox in Clowne from the beginning of the year to the end of April.

THE ROYAL SOCIETY'S CONVERSAZIONE.

THE first of the conversaziones, which it is the custom of the Royal Society to give every year, was held on Wednesday evening in the Society's rooms at Burlington House. The National Institute of Medical Research had a number of interesting exhibits. One of these, shown by Dr. E. H. J. Schuster, was a new recording kata-thermometer, in which the heating was carried out automatically by electricity after each cooling period, and the length of each such cooling period was automatically recorded on a roll of paper. Another exhibit from the same laboratory was that of Dr. Leonard Hill and Dr. Eidinow illustrating the lethal power of ultra-violet rays as manifested by granulation and loss of mobility in hay infusoria after exposure to the rays. A third exhibit from the National Institute embodied improvements made by Mr. J. E. Barnard and others in the method of dark-ground illumination for microscopical purposes; it was shown that a progressive increase of efficiency could be obtained by using illuminators of high numerical aperture, together with objectives corresponding thereto. Dr. Hele-Shaw, F.R.S., had on view a special laboratory filter of a simple and inexpensive type, which he called a stream-line filter, from the fact that the fluid which had to be filtered was caused to flow with a stream-line motion. The results of certain researches on the markings on the scales of herring as a means of estimating the growth of the fish were also shown, as well as some photo-micrographs of certain woods which had a peculiarly low thermal conductivity, and, from the Rothamsted Experimental Station, an illustration of the importance of the flocculation of soils. The Department of Zoology of the British Museum contributed a number of interesting African exhibits, including the contents of the stomach of a man-eating crocodile, and the modification of dentition of some African vertebrates. Another exhibitor, Mr. E. Hatschek, has succeeded in imitating organic forms by drops and vortices of gelatin. The gelatin was run into suitable coagulating solutions with the temperatures and densities so adjusted that the gelatin set to certain desired forms, and then, owing to shrinkage, a number of features like radial ribs, undulating membranes, coronated discs, and so forth, made their appearance; he had even succeeded in obtaining models astonishingly like red blood corpuscles. The research work of the Institute of Industrial Psychology was illustrated by charts showing how a study of the miner's movements in wielding the pick at the coal surface had effected an increase of about 16 per cent. in output, with lessened exertion for the miner. Another matter which appeared to be shown conclusively was that frosting the miner's standard lamp resulted in a striking reduction in the number and duration of the disturbing after-images, thus bearing out the claim of the

miners themselves that the frosted image afforded them better vision and caused less eyestrain. Another chart, which had to do with a different class of workers, showed the improvement in the work curve by introducing twice daily a fifteen minutes' period of change of work, or by encouraging rhythmical movements and reducing needless decisions. The exhibits included some examples of ancient as well as modern science. Among these were Egyptian water-clocks and some surveying instruments of the ancient Romans. The Jenner centenary found a reflection in the exhibition of the certificate of the candidature of Dr. Edward Jenner for the Fellowship of the Royal Society, a distinction he obtained in 1789.

RIVERS MEMORIAL FUND.

No one will question that the services of the late Dr. W. H. R. Rivers to the sciences in which he was particularly interested—first those of anthropology and ethnology, and later psychology—were so great as to deserve some permanent memorial. We are glad, therefore, to hear that a committee has been formed to give practical effect to a desire which has been expressed in many quarters. The committee includes Sir Charles Sherrington, President of the Royal Society, Sir Humphry Rolleston, President of the Royal College of Physicians, Sir James Frazer, Dr. Henry Head, Professor Elliot Smith, and Dr. C. S. Myers. The treasurer is Dr. L. E. Shore, St. John's College, Cambridge, to whom contributions may be sent. It is intended that the proceeds of the fund shall be devoted to the promotion of those sciences in which Dr. Rivers took a special interest, but until the amount and the wishes of the contributors are known no definite decision will be reached.

EXCHANGE PROFESSORS.

IN the article under this heading published last week (p. 827) describing the visit of Sir Harold Stiles to Boston, the first paragraph was unfortunately so expressed as to produce the impression that this was the first occasion on which such an exchange had taken place between this country and America. It ought to have been stated that Professor Gask, director of the surgical unit of St. Bartholomew's Hospital, went to Boston to replace Professor Cushing in the same way last year, and that in June, 1922, Professor Cushing reciprocated by occupying the chair at St. Bartholomew's Hospital for a similar period.

THE Ontario Legislature has established a research chair for Dr. Banting, the originator of the idea that diabetes might be controlled by extracts of the islands of Langerhans, for which the name "insulin" had been suggested by Sir Edward Schafer a good many years ago, and under which it has now become a commercial product. The success which attended the inquiry instituted by Drs. Banting and Best in Professor Macleod's laboratory in the University of Toronto is now well known. The income of the chair, to which Dr. Best will act as assistant, will be 10,000 dollars a year. Dr. Banting intends to be present at the discussion on diabetes in the Section of Medicine at the Annual Meeting of the British Medical Association in Portsmouth.

THE next session of the General Medical Council will begin on Tuesday, May 29th, at 2 p.m., when the President, Sir Donald MacAlister, will give an address on the work of the Council since the November session, and penal and other matters will be considered. Dr. W. L. H. Duckworth, Reader in Human Anatomy in the University of Cambridge, has been elected the representative of the University on the Council, in succession to Professor Hopkins, who did not desire reappointment.

MEDICAL SOCIETY OF LONDON.

150TH ANNIVERSARY DINNER.

THE 150th anniversary dinner of the Medical Society of London took place at the Hyde Park Hotel on May 15th. LORD DAWSON OF PENN presided, and the principal guest was H.R.H. The Prince of Wales. About 350 sat down at the tables, and the company included:

Viscount Astor, the Bishop of Birmingham, Dr. R. A. Bolam, Sir Anthony Bowlby, Lord Burnham, Sir Archibald Garrod, Viscount Gladstone, Sir William Hale-White, Dr. G. E. Haslip, Sir Thomas Horder, Sir Robert Jones, Viscount Knutsford, Major-General Sir William Leishman, Sir William Macewen, Sir George Newman, Lord Riddell, Sir Charles Sherrington, and Mr. H. J. Waring, Vice-Chancellor of the University of London.

LORD DAWSON, in proposing the health of the principal guest, said that in addition to the representatives of medicine there were many representatives of allied professions, with varied interests and gifts, but hosts and guests alike were one in loyalty and support for their beloved Prince. In his interest in medicine the Prince was following the tradition of his great ancestors. To kings in ancient times were ascribed powers of miraculous healing. In those old days who would not have preferred the "royal touch" to the rigours of medical treatment? Imagine fourteen doctors around the bedside of Charles II! But that "royal touch" still existed. It was a human touch. It was at the service alike of the individual and of the body politic. It was prompted not by favour, but by need. It owed its success not to miracle, but to high endeavour, unfailing kindness, and a feeling for human frailty.

THE PRINCE OF WALES'S TRIBUTE TO THE GENERAL PRACTITIONER.

THE PRINCE OF WALES said that it was a common boast among members of the medical profession that they practised the oldest science known to man. He could not imagine a time when doctors had not been needed. The only reason why they were not mentioned in the record of the Garden of Eden was evidently because Eve knew the prescription, "An apple a day keeps the doctor away." (Laughter.) That evening he was a solitary and nervous patient surrounded by many of the keenest practitioners in London—an island in a sea of medicine. But as one who had had long experience of the characteristic kindness of the profession, he would be ungenerous if he did not feel himself at home. Anybody who was as familiar with hospitals as himself could not have failed to observe that the art of healing had a particularly good effect on those who practised it. He went on to pay the general practitioner a special tribute. The general practitioner was a devoted and, he was afraid, sometimes an unrecognized friend of the community. Upon him in the long run the health and well-being of the community depended. Everyone outside the profession owed the general practitioner gratitude. In referring to the presence of three distinguished physicians from the United States, His Royal Highness remarked that America was "a country to which we owe a great deal," but when the laughter had subsided he said that he was referring to medicine, not to money. One aspect of the Society's history appealed to him particularly—namely, the close connexion between the Society and the national hospital system. The Society's foundation showed that medicine at that time, in 1773, was passing from the twilight of quackery into the clear light of science. The progress during those 150 years had proceeded on parallel lines with the growth of the modern hospital system. The hospitals were at once the school and the workshop of medical science—centres to which the doctor could go to get further knowledge, and the suffering to get the practical application of that knowledge. Without the hospitals medical science would be a comparatively barren thing. The Society had grown up alongside the hospital system; many of the great London hospitals dated from about the same period, and to that hospital system the Society had been a very loyal and helpful friend.